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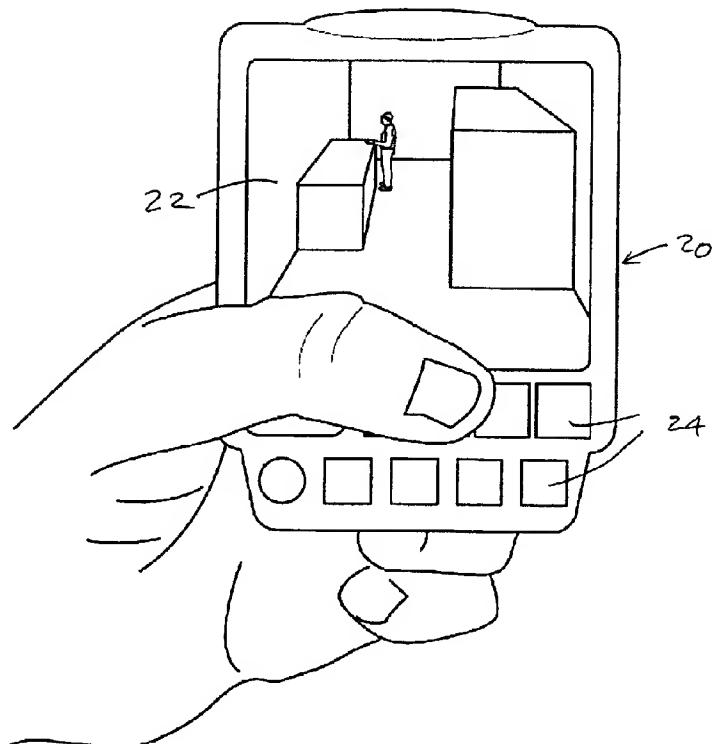
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[Continued on next page]

(54) Title: SECURITY SYSTEM FOR ROAD VEHICLES



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(57) Abstract: A security system for a road vehicle, particularly for detecting the presence of intruders in the load-carrying compartment of goods vehicle, comprises at least one video camera for surveilling an interior space of the vehicle, or an exterior zone adjacent the vehicle, a portable viewing unit to receive video signals transmitted from the camera and display the view captured by the camera, and video recording means provided in the portable viewing unit or installed in the vehicle, for recording the video signals.



(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,
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SECURITY SYSTEM FOR ROAD VEHICLES

The present invention relates to a security system for road vehicles and more particularly, but not solely, to a system for detecting the presence of intruders in or entering the load-carrying compartments of lorries, trucks or other goods vehicles.

The entry of unauthorised persons into lorries or trucks is an increasing problem, either to steal goods from within or the vehicle or, in the case of illegal immigrants, to seek transport from one country to another.

10 I have now devised a security system for detecting the presence of intruders or unauthorised persons within or entering a vehicle, but which may be used to provide other aspects of vehicle security.

In accordance with the present invention, There is provided a security system for installation in, or installed in, a road vehicle, the security system comprising at least one video camera for surveilling an interior space of the vehicle or an exterior zone adjacent the vehicle, means for transmitting video signals from said video camera, a portable viewing unit arranged to receive said video signals and display a view captured by said video camera, and video recording means provided in said portable viewing unit or installed, or arranged to be installed, in said vehicle, for recording said video signals.

25 The arrangement enables a user to observe, from a remote position, the view captured by the or each video camera. Preferably the user is able to observe such view in real time, or alternatively the user may play back the recording from the camera, or any selected camera.

30 Where one or more cameras are installed within a load-carrying compartment of the vehicle, or to view an external zone adjacent an entry point to such compartment, the system provides effective protection against intruders who might be intent on stealing goods from the vehicle or stowing away (as 35 in the case of illegal immigrants).

Preferably the system includes one or more sensors

arranged to detect the presence of an intruder in the viewing zone of the or a camera, in order to activate the respective camera and commence recording the scene viewed by the camera. Preferably the system transmits an alarm signal to the viewing unit when the or a sensor detects the presence of an intruder, to alert the user. Instead of commencing to record in response to the detection of an intruder, the recording means may record continuously.

The video recording means may record the video signals onto any desired form of recording medium, for example video tape, CD, DVD or computer hard disc. The recording means may record the views from a number of cameras simultaneously. For viewing, whether in real time or in play back, the viewing unit may display the views of two or more cameras simultaneously.

Preferably the system is arranged to time-stamp the recordings from each camera, then to display the corresponding time stamp on the viewing unit at least during play back.

Preferably the system is arranged to receive inputs representing one or more vehicle operating conditions (for example vehicle speed) and to record corresponding data, for display on the viewing unit.

It will be appreciated that the system also provides security against the vehicle being stolen and driven away, or being damaged whilst the vehicle is unattended. The system further provides evidence in the case of an accident.

An embodiment of the present invention will now be described by way of example only and with reference to the accompanying drawings, in which:

FIGURE 1 is a side view of an articulated lorry or truck equipped with a security system in accordance with the present invention;

FIGURE 2 is an enlarged, partially cut-away side view of a front end portion of the lorry shown in Figure 1;

FIGURE 3 is a similarly enlarged, cut-away side view of a rear end portion of the lorry shown in Figure 1;

FIGURE 4 is a front view of a portable viewing unit of

the security system;

FIGURE 5 is a side view of the portable viewing unit shown in Figure 4;

FIGURE 6 is a schematic block diagram of the security 5 system; and

FIGURE 7 is a view of the viewing unit, shown held in the user's hand and displaying a view of the interior of the load-carrying compartment of the lorry of Figure 1; and

FIGURE 8 is a side view of a car equipped with a 10 security system in accordance with the present invention.

Referring to Figures 1 to 3 of the accompanying drawings, there is shown an articulated lorry or truck which comprises a tractor unit 10 and a trailer 12. The trailer 12 comprises a load carrying compartment 14. The vehicle is 15 equipped with a security system in accordance with the present invention, which comprises video cameras VC1, VC2 and VC3, for example wide angle cameras. Cameras VC1 and VC2 are installed within the load-carrying compartment 14 and are positioned, in the example shown, on the front and rear walls, respectively, 20 and adjacent the roof of the compartment. In general, however, the system may include any desired number of video cameras within the load-carrying compartment 14 and these cameras may be mounted at any desired positions, suited to provide views of desired zones of the compartment interior. 25 The video camera VC3 is mounted to the exterior of the tractor unit 10 and, in the example shown, is directed rearwardly towards the trailer 12: in general, however, the security system may include any number of video cameras mounted to the exterior of the tractor unit and/or trailer, to view any 30 desired zones outside the vehicle.

The security system further comprises a recording and transmitting unit (not shown) installed in the cab of the tractor unit 10. The video outputs of the video cameras are passed to this unit, for recording and also for radio 35 transmission to the hand-held viewing unit, shown in Figures 4 to 6.

Thus, referring to Figures 4 to 6 of the drawings, the

security system further comprises a portable or hand-held viewing unit 20 which comprises a flat, generally rectangular casing in which a flat panel video screen 22 is mounted. A number of control keys 24 are provided on the front of the 5 casing, below the screen 22, and on one or both sides of the casing.

Figure 6 is a schematic block diagram of the security system and shows the video cameras VC1, VC2, VC3 and the recording and transmitting unit 30 which is, in use, 10 installed in the lorry cab. The latter unit comprises a video recorder 32 for recording the views captured by the video cameras, a transmitter/receiver 34 for transmitting the video signals from the cameras to the hand-held viewing unit 20, and a central controller 38. The system further comprises a 15 number of sensors 36 for detecting the presence of an intruder in the vicinity of any of the video cameras. These sensors may be of any suitable type, including passive infra-red sensors. The system is arranged so that, when any of the sensors detects the presence of an intruder, the corresponding 20 video camera is activated and the recording unit 32 is able to record the view from every camera which is activated. The system is also arranged to transmit an alarm signal, when any intruder is detected, to a transmitter/receiver 26 of the hand-held viewing unit, and to energise an audible or other 25 alarm of this unit. The user may then switch on the video display and observe the view captured by the video camera as shown in Figure 7. This view may be observed in real time, or the user may operate the recording unit, via the controls 24, a central controller 28 and the transmitter/receiver 26 of the 30 viewing unit, to play back the recording from any of the video cameras. The arrangement is such that the user may, if desired, control the viewing unit 20 to display the views or recordings from two or more video cameras simultaneously, in different areas of the video screen.

35 The video recorder may record onto any desired video recording medium, for example video tape, CD, DVD or computer hard disc. The recording medium may be removable and/or

replaceable as and when desired and may be wipeable or re-writable.

The control keys 24 of the viewing unit may be arranged to switch the recorder on and off, whether to initiate 5 recording in respect of any one or more of the cameras, or for play back. The keys enable the user to select which recording (i.e. from which camera) is played back, or which camera recordings to play back and display simultaneously. The keys enable the recordings to be played in search mode, for example 10 fast forwards or fast back, to find any particular part of the recording to view. Also, the keys enable the picture quality and/or recording quality to be controlled.

The recording unit and cameras may be powered by the vehicle's own electrical system, or they may be provided with 15 a dedicated battery. The system may be arranged to display a battery power-level indication on the screen of the viewing unit. The screen of the viewing unit may also display a real time clock. It may also indicate to which camera the recording or view relates.

20 The system may be arranged to receive inputs representing one or more vehicle operating conditions and record data representing those conditions, for display on the screen of the viewing unit. Such vehicle operating conditions may comprise any one or more of the vehicle speed, whether its 25 brakes are on or off, whether its hand brake is on or off, which gear is selected, whether the vehicle lights are on or off, and whether the ignition key is in the ignition switch.

The system is preferably arranged to time-stamp the video recordings, so that during play back the screen of the 30 viewing unit indicates the time at which the corresponding recording was made.

The security system has been described installed in a lorry or truck, particularly for detecting the presence of intruders such as illegal immigrants in or entering the load-35 carrying compartment of the vehicle. The security system may however be installed in a car or other road vehicle, to protect the vehicle against theft or damage. Referring to

Figure 8, there is shown a car 40 equipped with the security system, including video cameras VC4, VC5 mounted externally of the vehicle, respectively in any of the wing mirror housings and to the top rear of the vehicle. One or more other cameras 5 may be mounted within the passenger compartment of the vehicle. The recording and transmitting unit may be installed in any convenient location, for example within the passenger compartment or in the boot of the vehicle.

In a modification to the security system which has been 10 described, the recording unit may be incorporated into the hand-held viewing unit.

CLAIMS

- 1) A security system for installation in, or installed in, a road vehicle, the security system comprising at least one video camera for surveilling an interior space of the vehicle
5 or an exterior zone adjacent the vehicle, means for transmitting video signals from said video camera, a portable viewing unit arranged to receive said video signals and display a view captured by said video camera, and video recording means provided in said portable viewing unit or
10 installed, or arranged to be installed, in said vehicle, for recording said video signals.
2. A security system as claimed in claim 1, comprising one or more sensors for detecting the presence of an intruder, to activate the or a said video camera and said recording means.
- 15 3. A security system as claimed in claim 2, arranged to transmit an alarm signal to said viewing unit upon detecting the presence of an intruder.
4. A security system as claimed in any preceding claim, in which said viewing unit includes control keys for controlling
20 the play back of the recording means.
5. A security system as claimed in any preceding claim, in which the viewing unit is arranged for displaying the views of two or more cameras simultaneously.
6. A security system as claimed in any preceding claim,
25 arranged to time-stamp the video recording from the or each camera.
7. A security system as claimed in any preceding claim, arranged to record data in respect of one or more vehicle operating conditions.

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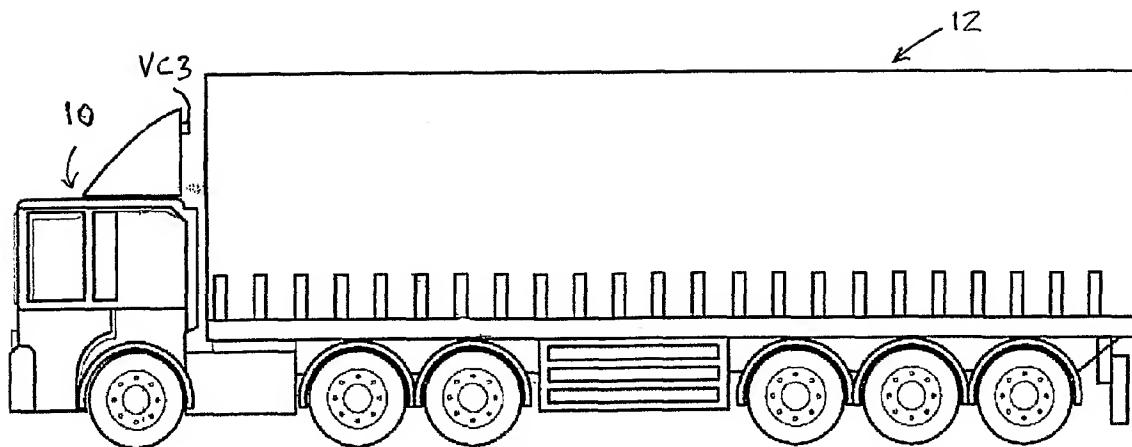


Figure 1

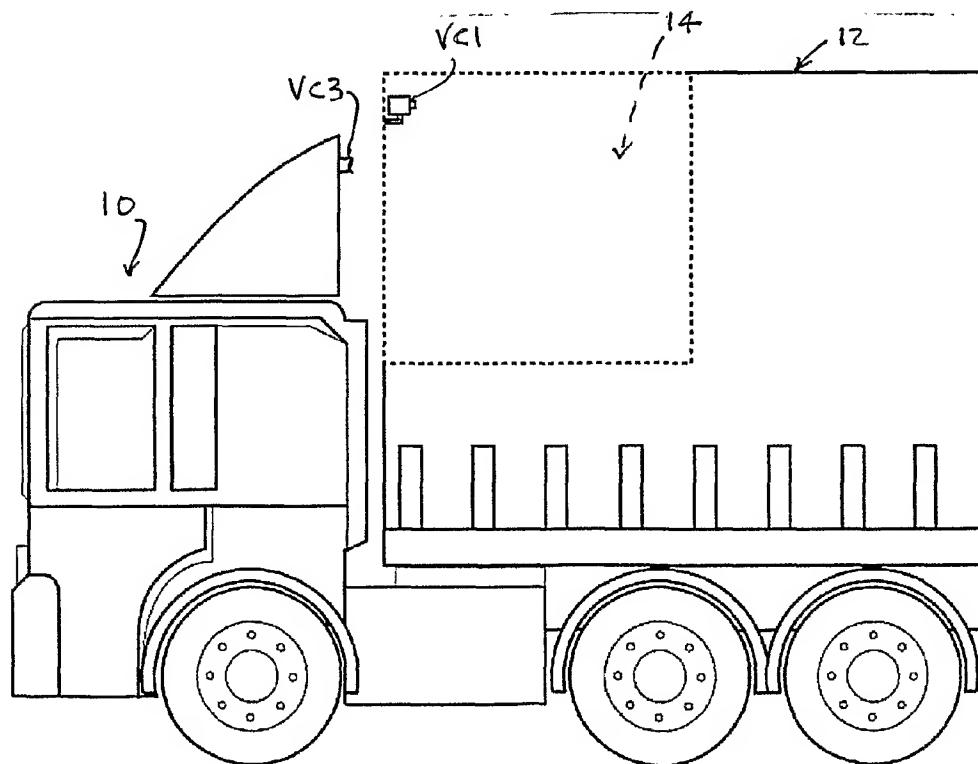


Figure 2

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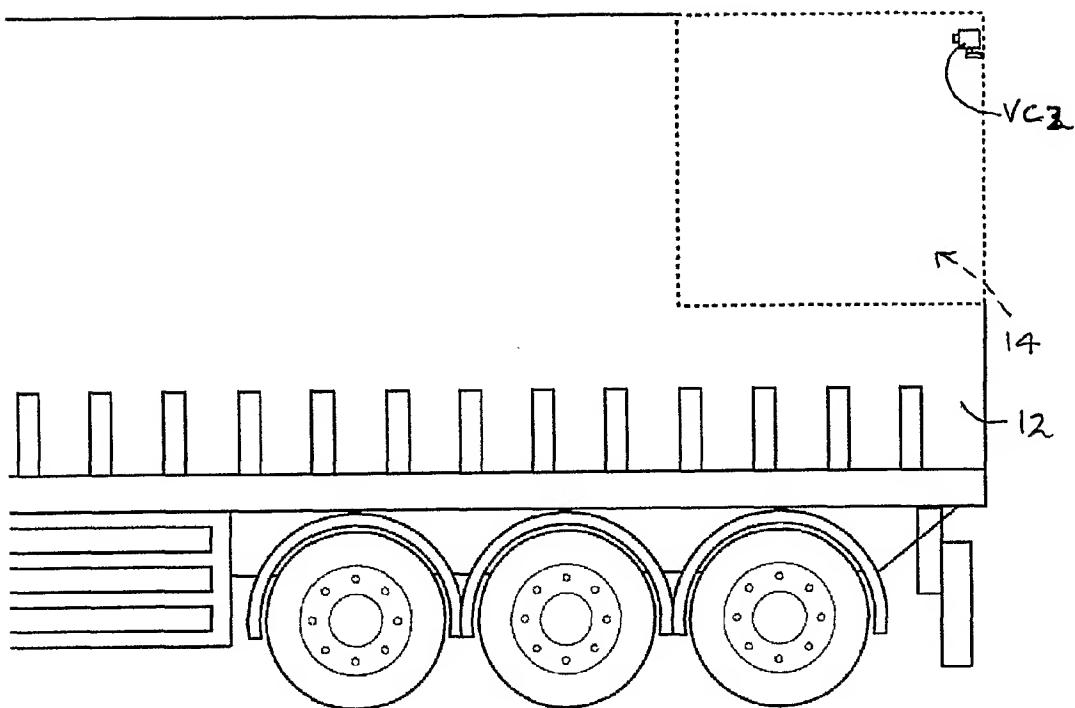


Figure 3

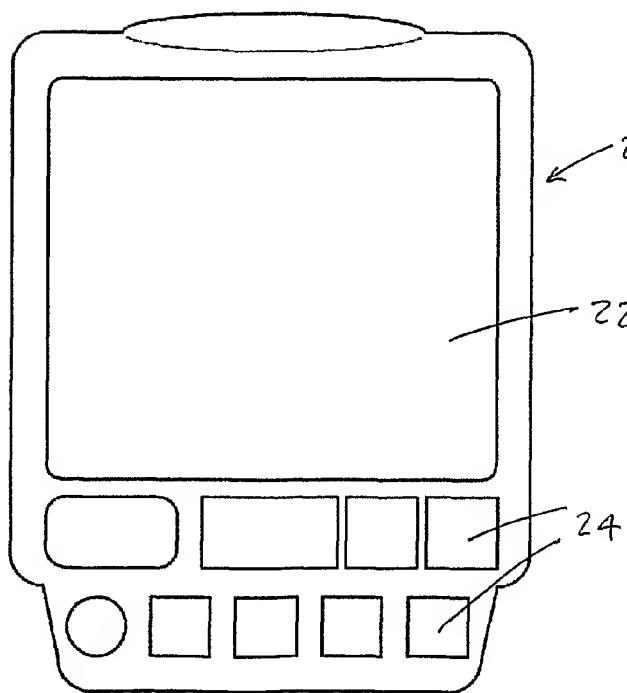


Figure 4

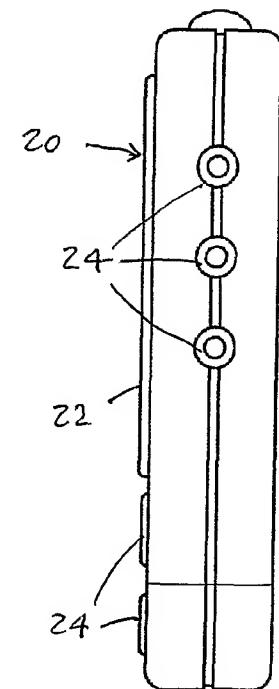


Figure 5

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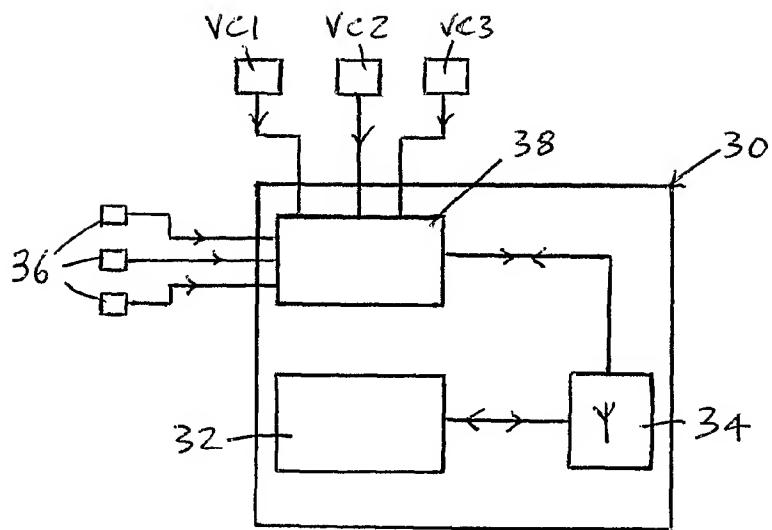
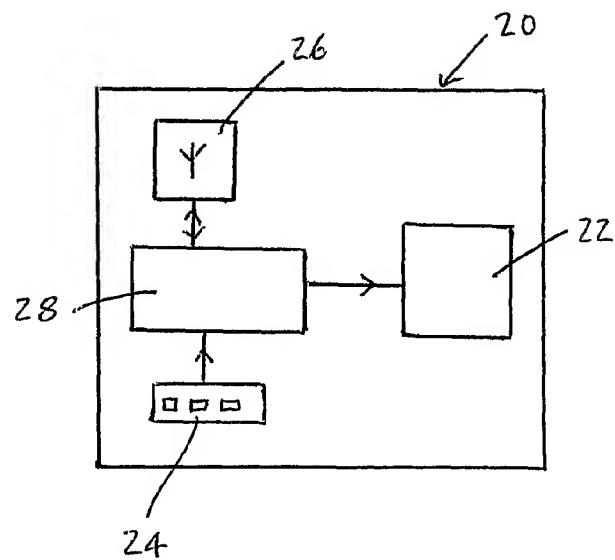


Figure 6



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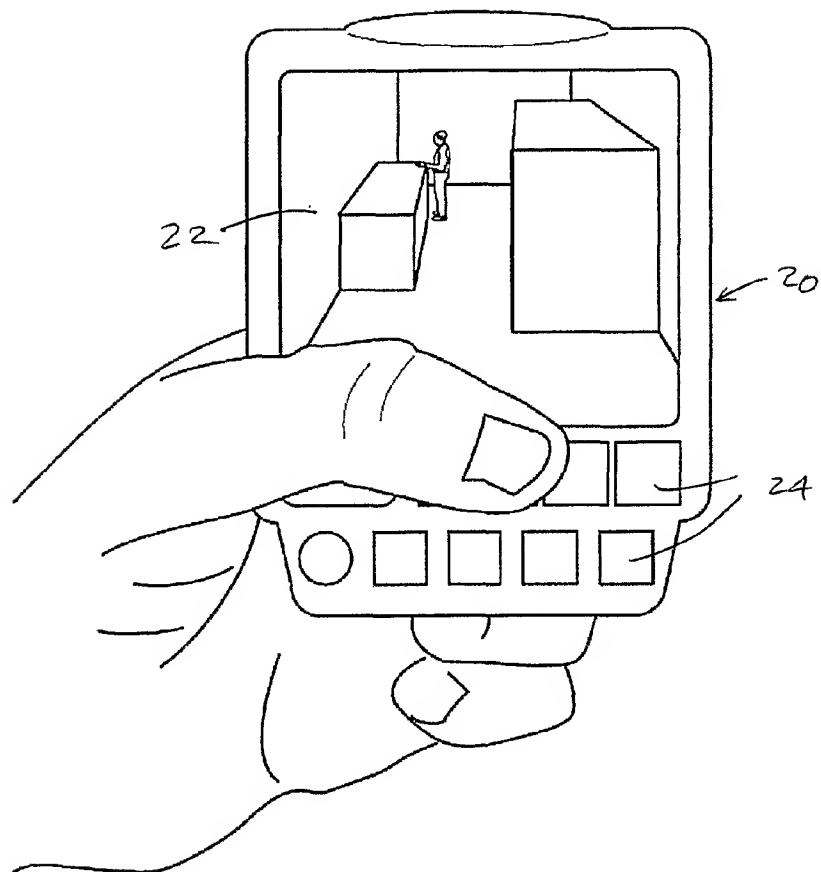


Figure 7

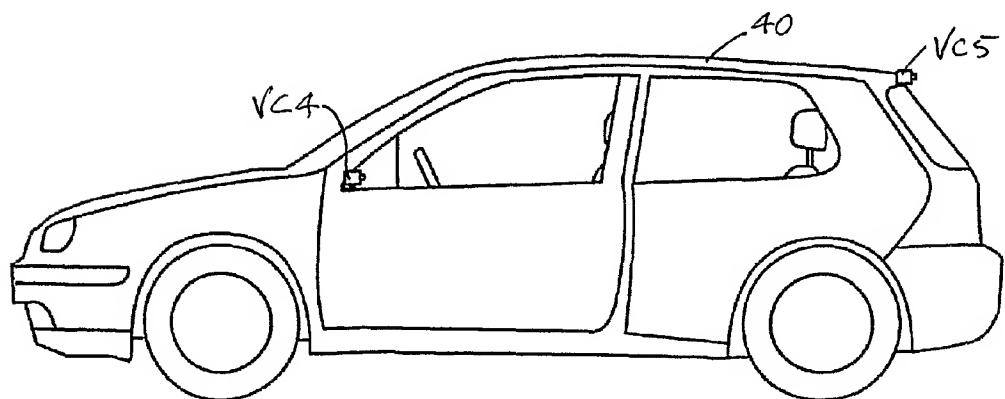


Figure 8

INTERNATIONAL SEARCH REPORT

I onal Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G08B13/196 B60R25/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G08B H04N B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 037 977 A (PETERSON ROGER) 14 March 2000 (2000-03-14) column 3, line 10 - line 18 column 4, line 18 - line 19 column 6, line 36 - line 37 column 7, line 35 - line 36 column 8, line 30 - line 39 figure 2 column 9, line 56 - line 60 claim 6 figures 3,4 --- -/-/	1,4-7

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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- *A* document defining the general state of the art which is not considered to be of particular relevance
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Date of the actual completion of the International search

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18 September 2002

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 02/02201

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 147 598 A (JANKY JAMES M ET AL) 14 November 2000 (2000-11-14) column 2, line 10 - line 33 column 3, line 50 - line 62 column 4, line 18 - line 27 column 5, line 19 - line 30 column 8, line 8 - line 30 -----	1-3
X	EP 0 588 699 A (BIASOLI GILBERT) 23 March 1994 (1994-03-23) column 1, line 33 - line 38 column 2, line 6 - line 10 column 3, line 24 - line 36 column 4, line 39 - line 41 -----	1-3
A	CA 2 087 755 A (BLACKWELL ERROL) 22 July 1994 (1994-07-22) the whole document -----	1-3

INTERNATIONAL SEARCH REPORT

Information on patent family members

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